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**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

- 1           1. (Currently amended) A transmitter for use in performing channel sounding,  
2 comprising:  
3           a source of an orthogonal sequence which is repeatedly supplied, said orthogonal  
4 sequence having been developed as a function of first and second existing orthogonal  
5 sequences and being such that ~~it~~ said orthogonal sequence would have a perfectly white  
6 spectrum were ~~it~~ said orthogonal sequence to be repeated an infinite number of times; and  
7           a modulator for producing a modulated signal by modulating a carrier signal by  
8 said orthogonal sequence, said modulator being coupled to said source;  
9           whereby no channel filtering is required between said source and said modulator  
10 to reduce out-of-band emissions caused by said source.
- 1           2. (Original) The invention as defined in claim 1 wherein said source of an  
2 orthogonal sequence is a memory which stores said orthogonal sequence.
- 1           3. (Original) The invention as defined in claim 1 wherein said source of an  
2 orthogonal sequence is a sequence generator.
- 1           4. (Original) The invention as defined in claim 1 further comprising an antenna  
2 coupled to said modulator for broadcasting said modulated signal.
- 1           5. (Previously presented) The invention as defined in claim 1 wherein no filtering  
2 is performed between said source and said modulator.

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1           6. (Currently amended) A transmitter for use in performing channel sounding,  
2 comprising:

3           means for repeatedly supplying an orthogonal sequence that is a function of first  
4 and second existing orthogonal sequences and has a perfectly white spectrum should ~~it~~  
5 said orthogonal sequence be repeated an infinite number of times; and

6           means for modulating a carrier signal by said orthogonal sequence, said means for  
7 modulating being coupled to said means for repeatedly supplying;

8           whereby no channel filtering to reduce out-of-band emissions caused by said  
9 means for supplying is required between said means for repeatedly supplying and said  
10 means for modulating.

1           7. (Original) The invention as defined in claim 6 wherein said means for  
2 repeatedly supplying is a memory which stores said orthogonal sequence.

1           8. (Currently amended) The invention as defined in claim 6 wherein said means  
2 for repeatedly supplying is a ~~is a~~ sequence generator.

1           9. (Original) The invention as defined in claim 6 further comprising means for  
2 broadcasting said modulated signal.

1           10. (Original) A receiver for use in performing channel sounding, comprising:  
2 a demodulator for demodulating a received version of an orthogonal sequence that  
3 modulates a carrier and which is repeated at least once and was derived as a function of  
4 first and second existing orthogonal sequences to produce a baseband demodulated  
5 received orthogonal sequence; and

6           a finite impulse response (FIR) filter implementing a least squares algorithm to  
7 produce a channel estimate, said FIR filter being coupled to receive said demodulated  
8 received orthogonal sequence from said demodulator;

9           whereby no channel filtering is performed between said demodulator and said FIR  
10 filter to reduce out-of-band noise inherently resulting from an orthogonal sequence that  
11 modulated a carrier for transmission by a transmitter to ultimately become said received  
12 version after passing through a channel and being received.

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1           11. (Original) The invention as defined in claim 10 wherein coefficients of said  
2           FIR filter are complex conjugate values of said orthogonal sequence.

1           12. (Original) The invention as defined in claim 10 further comprising an  
2           averager for averaging a plurality of channel estimates produced by said FIR filter.

1           13. (Original) The invention as defined in claim 10 further comprising a  
2           bandlimiting filter coupled between said demodulator and said FIR filter for reducing  
3           out-of-band noise that was introduced into said baseband demodulated received  
4           orthogonal sequence through said channel or at said receiver.

1           14. (Currently amended) The invention as defined in claim 10 further comprising  
2           means for receiving a wirelessly broadcast version of said modulated version of a  
3           orthogonal sequence and converting it said modulated version of said orthogonal  
4           sequence into an electrical representation.

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1           15. (Currently amended) A system for use in performing channel sounding,  
2 comprising:

3           a transmitter, said transmitter including

4                   a source of an orthogonal sequence which is repeatedly  
5                   supplied as an output, said orthogonal sequence (i) having been  
6                   developed as a function of first and second existing orthogonal  
7                   sequences and (ii) having a perfectly white spectrum ~~should it be~~  
8                   when repeated an infinite number of times;

9                   a modulator for modulating a carrier signal by said  
10                  orthogonal sequence, said modulator being coupled to said source ;

11                  whereby no channel filtering is required between said  
12                  source and said modulator to reduce out-of-band emissions caused  
13                  by said source; and

14          a receiver including

15                  a demodulator for demodulating a received modulated  
16                  version of said orthogonal sequence that modulates a carrier and  
17                  was transmitted by said transmitter;

18                  a finite impulse response (FIR) filter implementing a least  
19                  squares algorithm for developing an estimate of the channel  
20                  characteristic, said FIR filter being coupled to receive said  
21                  demodulated orthogonal sequence from said demodulator;

22                  whereby no channel filtering is performed between said  
23                  demodulator and said FIR filter to reduce out-of-band noise  
24                  inherently resulting from said orthogonal sequence prior to its  
25                  being supplied to said modulator.

1           16. (Original) The invention as defined in claim 15 wherein said demodulated  
2 training sequence is filtered using a band-limiting filter to eliminate out of band noise  
3 picked up at said receiver prior to being received by said FIR filter, there being no such  
4 band-limiting filter in said transmitter.

1           17. (Original) The invention as defined in claim 15 wherein said receiver further  
2 comprises an averaging filter for averaging said estimate of the channel characteristic  
3 developed by said FIR filter.

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1           18. (Currently amended) A transmitter for use in performing channel sounding,  
2 comprising:  
3           a supplier of a plurality of orthogonal sequences each of which is a version of an  
4 original orthogonal sequence, each of said plurality of orthogonal sequences being  
5 repeatedly supplied, said original orthogonal sequence having been developed as a  
6 function of first and second existing base orthogonal sequences and having a perfectly  
7 white spectrum should it said original orthogonal sequence be repeated an infinite number  
8 of times; and  
9           a plurality of modulators for producing a plurality of modulated signals by  
10 modulating a carrier signal by said each of said plurality of orthogonal sequences, said  
11 modulators being coupled to said supplier so that no channel filtering to reduce  
12 out-of-band emissions caused by any of said orthogonal signals is performed on said  
13 orthogonal sequence between said ~~store~~ supplier and any of said modulators.

1           19. (Original) The invention as defined in claim 18 wherein said supplier of a  
2 plurality of orthogonal sequences comprises a source of said original orthogonal sequence  
3 and at least one delaying element.

1           20. (Original) The invention as defined in claim 18 wherein said plurality of  
2 orthogonal sequences include at least said original orthogonal sequence and at least one  
3 delayed version of said original orthogonal sequence.

1           21. (Original) The invention as defined in claim 18 further comprising a plurality  
2 of antennas, each of said antennas being coupled to a respective one of said modulators.

1           22. (Original) The invention as defined in claim 18 wherein said plurality of  
2 orthogonal sequences include at least said original orthogonal sequence and at least two  
3 delayed version of said original orthogonal sequence, wherein the delay between each  
4 orthogonal sequence of said plurality of orthogonal sequences is substantially equal.

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1           23. (Original) The invention as defined in claim 18 wherein said plurality of  
2 orthogonal sequences include at least said original orthogonal sequence and at least two  
3 delayed version of said original orthogonal sequence, wherein the delay between each  
4 orthogonal sequence of said plurality of orthogonal sequences is not substantially equal.

1           24. (Currently amended) A system for use in performing channel sounding,  
2 comprising:

3           a transmitter, said transmitter including

4                   a source of an orthogonal sequence which is repeatedly  
5 supplied as an output, said orthogonal sequence having been  
6 developed as a function of first and second existing orthogonal  
7 sequences and having a perfectly white spectrum should it said  
8 original orthogonal sequence be repeated an infinite number of  
9 times;

10                  a modulator for modulating a carrier signal by said  
11 orthogonal sequence, said modulator being coupled to said source;

12                  whereby no channel filtering is required between said  
13 source and said modulator to reduce out-of-band emissions; and

14           a receiver including

15                   a demodulator for demodulating a received modulated  
16 version of said orthogonal sequence that modulates a carrier and  
17 was transmitted by said transmitter;

18                  a finite impulse response (FIR) filter implementing a least  
19 squares algorithm for developing an estimate of the channel  
20 characteristic, said FIR filter being coupled to receive said  
21 demodulated orthogonal sequence from said demodulator without  
22 passing through a filter that has a corresponding filter function in  
23 said transmitter.

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1           25. (Currently amended) A transmitter for use in performing channel sounding,  
2 comprising:

3           means for repeatedly supplying a plurality of orthogonal sequences that are each a  
4 version of an original orthogonal sequence that is a function of first and second existing  
5 basic orthogonal sequences, each of said plurality of orthogonal sequences having a  
6 perfectly white spectrum ~~should it be~~ when repeated an infinite number of times; and

7           means for modulating each of a plurality of identical carrier signals by a  
8 respective one of said plurality of orthogonal sequences, each of said means for  
9 modulating being coupled to said means for repeatedly supplying so that no channel  
10 filtering to reduce out-of-band emissions is performed on any of said plurality of  
11 orthogonal sequences between said source and said modulator.

1           26. (Original) The invention as defined in claim 25 further comprising a plurality  
2 of means for broadcasting said modulated signal each of said means for broadcasting  
3 being coupled to a respective one of said means for modulating.

1           27. (Original) The invention as defined in claim 25 wherein said plurality of  
2 orthogonal sequences include at least said original orthogonal sequence and at least two  
3 delayed version of said original orthogonal sequence, wherein the delay between each  
4 orthogonal sequence of said plurality of orthogonal sequences is substantially equal.

1           28. (Original) The invention as defined in claim 25 wherein said plurality of  
2 orthogonal sequences include at least said original orthogonal sequence and at least two  
3 delayed version of said original orthogonal sequence, wherein the delay between each  
4 orthogonal sequence of said plurality of orthogonal sequences is not substantially equal.

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1           29. (Currently amended) A receiver for use in performing channel sounding,  
2 comprising:

3           a plurality of demodulators, each of said demodulators demodulating a respective  
4 plurality of received versions of an original orthogonal sequence that each modulates a  
5 carrier and which is repeated at least once and was derived as a function of first and  
6 second existing basic orthogonal sequences; and

7           a plurality of finite impulse response (FIR) filters implementing a least squares  
8 algorithm to produce a plurality of channel estimates, one for each of said received  
9 versions of said original orthogonal sequence of said plurality, each of said FIR filters  
10 being coupled to receive its respective plurality of demodulated orthogonal sequences  
11 from a respective one of said demodulators ~~to which it is coupled~~ without any channel  
12 filtering to reduce out-of-band emissions inherently resulting from said versions of said  
13 original orthogonal sequence that modulated said carrier to ultimately become said  
14 received versions after passing through a channel and being received being performed  
15 between said demodulator and said respective associated FIR filter.

1           30. (Original) The invention as defined in claim 29 further comprising a  
2 demultiplexer for separating out each channel estimate supplied as an output by the one  
3 of said FIR filters to which said demultiplexer is coupled.

1           31. (Original) The invention as defined in claim 29 further comprising a  
2 bandlimiting filter coupled between at least one of said demodulators and its associated  
3 respective one of said FIR filters for reducing out-of-band noise that was introduced into  
4 said baseband demodulated received orthogonal sequence through said channel or at said  
5 receiver.

1           32. (Original) The invention as defined in claim 29 further comprising an  
2 averager for averaging a plurality of channel estimates produced by the one of said FIR  
3 filters to which said averager is coupled.



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- 1           33. (Original) A receiver for use in performing channel sounding, comprising:  
2           means for demodulating a received version of an orthogonal sequence that  
3           modulates a carrier and which is repeated at least once and was derived as a function of  
4           first and second existing orthogonal sequences; and  
5           means for implementing a least squares algorithm using finite impulse response  
6           (FIR) filtering to produce a channel estimate, said means for implementing being coupled  
7           to receive said demodulated orthogonal sequence from said means for demodulating  
8           without any channel filtering being performed between said means for demodulating and  
9           said means for implementing.

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1        34. (Currently amended) A system for use in performing channel sounding,  
2 comprising:

3        a transmitter, said transmitter including

4                a supplier of a plurality of orthogonal sequences each of  
5                which is a version of an original orthogonal sequence, each of said  
6                plurality of orthogonal sequences being repeatedly supplied, said  
7                original orthogonal sequence (i) having been developed as a  
8                function of first and second existing base orthogonal sequences and  
9                (ii) having a perfectly white spectrum ~~should it be~~ when repeated  
10                an infinite number of times; and

11                a plurality of modulators for producing a plurality of  
12                modulated signals by modulating a carrier signal by said each of  
13                said plurality of orthogonal sequences, said modulators being  
14                coupled to said source so that no channel filtering to reduce out-  
15                of-band emissions caused by said orthogonal sequences is  
16                performed on said orthogonal sequences between said supplier and  
17                said modulators; and

18        a receiver including

19                a plurality of demodulators, each of said demodulators  
20                demodulating a respective plurality of received versions of said  
21                original orthogonal sequence that each modulates said carrier; and

22                a plurality of finite impulse response (FIR) filters  
23                implementing a least squares algorithm to produce a plurality of  
24                channel estimates, one for each of said received versions of said  
25                original orthogonal sequence of said plurality, each of said FIR  
26                filters being coupled to receive its respective plurality of  
27                demodulated orthogonal sequences from a respective one of said  
28                demodulators ~~to which it is coupled~~ without any channel filtering  
29                to reduce out-of-band emissions inherently resulting from said  
30                versions of said original orthogonal sequence that modulated said  
31                carrier to ultimately become said received versions after passing  
32                through a channel and being received being performed between  
33                said demodulator and said respective associated FIR filter.

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1           35. (Original) The invention as defined in claim 34 further comprising a plurality  
2 of demultiplexers, each of said demultiplexers separating out each channel estimate  
3 supplied as an output by the one of said FIR filters to which it is coupled.

1           36. (Original) The invention as defined in claim 34 further comprising a  
2 bandlimiting filter coupled between at least one of said demodulators and its associated  
3 respective one of said FIR filters for reducing out-of-band noise that was introduced into  
4 said baseband demodulated received orthogonal sequence through said channel or at said  
5 receiver.

1  
1           37. (Currently amended) A method for use in performing channel sounding,  
2 comprising the steps of:  
3           repeatedly supplying an orthogonal sequence that (i) is a function of first and  
4 second existing orthogonal sequences and (ii) has a perfectly white spectrum ~~should it be~~  
5 when repeated an infinite number of times;  
6           modulating a carrier signal by said orthogonal sequence, said means for  
7 modulating being coupled to said means for repeatedly supplying;  
8           whereby no channel filtering to reduce out-of-band emissions is required between  
9 said means for repeatedly supplying and said means for modulating; and  
10          recording said modulated carrier signal.

1  
1           38. (Original) The invention as defined in claim 37 further comprising the step of  
2 playing back said recorded modulated carrier signal.